Assessment of Female Sexual Dysfunction in Patients with Premenopausal Female Pattern Hair Loss

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Abstract

Introduction: Female sexual dysfunction (FSD) is a serious problem that affects negatively the quality of life, interpersonal relationships and female self-confidence and might be a direct cause of psychopathological disturbances. Female pattern hair loss (FPHL) is a common cosmetically disturbing condition affecting many women with social and psychological consequences. **Aim of the Work:** Assessment of the relationship between female sexual dysfunction and Female pattern hair loss in premenopausal females. **Methods:** A case-control study was carried on 47 female patients with FPHL and 43 age-matched control women without FPHL among premenopausal women attending dermatology and Andrology outpatient's clinics, Suez Canal University hospital during the period from May 2018 to January 2019. History taking, clinical examination and hormonal investigation (Free Testosterone, Total Testosterone, and SHBG) were performed to all participants in the study. **Main Outcome Measures:** The Female Sexual Function Index (FSFI) was used to assess the key aspects of female sexual function in patients and controls. FPHL was diagnosed and graded by Ludwig's classification. **Results:** Mean age of patients group was 30.12 ± 5.49 years, Regarding FPHL grading, 55.3%, 42.6% & 2.1% of patients were grades 1, 2 and 3 Ludwig's classification respectively. FSD was found in 44.7% of patients while it was 44.2% in control group (P > 0.05). FSFI score in patients group was 26.40 ± 4.61 and in control group was 27.05 ± 3.12 (P > 0.05). Correlation between FSD prevalence and grade of FPHL by Ludwig's classification was statistically insignificant. FSD

was significantly compromised by increasing age and parity in patients and control groups (P < 0.05). **Conclusions:** The present study suggests that FSD was not significantly related to FPHL. Increased age and parity may have strong impact on sexual function in premenopausal women, while androgen hormones levels were not determinant factor.

Keywords

Female Sexual Dysfunction, FPHL, FSFI

1. Introduction

Human sexual activity is a natural basic instinct affected by numerous social, organic, psychological, cultural elements and partners' interpersonal aspects. Female sexual dysfunction affects negatively the family environment, profitability and other social connections and this in turn causes marked mental stress, depression, restlessness and affects greatly management process and treatment efficacy [1].

Definition of Female sexual dysfunction is a disorder of desire, arousal, orgasm, and sexual pain that results in marked interpersonal personal distress or challenges. Female sexual dysfunction affects about 43% of females [2].

Female sexual dysfunction is highly prevalent in Egypt. Several female factors as age, Body image, female circumcision and early age of marriage, female education, religious aspects, hormonal factors and financial aspects, and male partner factors like age and the presence of male sexual dysfunction could explain that high prevalence [3].

Female sexual dysfunction can be diagnosed by various questionnaires like the Sexual Function and Satisfaction Brief Profile measure (PROMIS) [4], the Sexual Function Questionnaires (SFQ) [5] and the Female Sexual Function Index (FSFI) [6]. FSFI is the most widely and commonly used questionnaire to assess female sexual dysfunction [7].

Female pattern hair loss (FPHL) previously known as female androgenetic alopecia (AGA) is a highly prevalent problem affecting up to one half of females. The clinical presentation of this condition is variable, ranging from minimal generalized hair thinning to more severe hair loss. A combination of genetic and hormonal causes leads to the occurrence of FPHL in females. Exposure of hair follicle to dihydrotestoseterone (DHT) leads to shrinkage and regression of hair follicles causing non-scarring female androgenetic alopecia. Primary complaints usually gradual thinning of hair in the crown and central areas of the scalp and may extend to frontal areas. Frontal hair line is usually preserved and absent temporal recession is always present [8].

FPHL has various significant psychological consequences. Low self-esteem, anxiety, depression and social phobias had been reported in females with FPHL in comparison to men with male pattern hair loss (MPHL) [9].

Sancak *et al.* in 2016 studied the relation between female pattern hair loss and female androgenetic alopecia and they reported that age, female AGA, metabolic syndrome, and free testosterone might have a strong impact on sexual functions in premenopausal women [10].

In present study, we are going to study the relationship between FSD and FPHL in premenopausal Egyptian females, which in turn allow us to manage sexual dysfunction in Egyptian females.

2. Patients and Methods

This study was carried out as case control study; 47 female patients were recruited from dermatology and venereology outpatient clinics, Suez Canal University hospital during the period from May 2018 to January 2019. Patients agreed to participate in the study were randomly collected according to planned eligibility criteria. Inclusion criteria included sexually active married females aging from 20 to 40 years with diagnosis of female pattern hair loss and had a regular sexual relationship with normal available husbands. Exclusion criteria included pregnant and menopausal women, females with sex hormones abnormalities, husband's erectile and ejaculatory dysfunction, telogen effluvium, cicatricial alopecia, females receiving hormonal contraceptives, antidepressants, tranquilizers or hormonal treatment in the last 3 months prior to the study and females with psychiatric disorders and chronic debilitating diseases (malignancy, chronic renal disease, chronic liver disease etc.).

Control group: 43 normal control females fulfilled inclusion and exclusion criteria as patient's group except of having female pattern hair loss was recruited from patients attending dermatology clinic with complaints rather than hair fall or from normal volunteers.

This study was approved by the Institutional Review Board and the Ethics Committee of Faculty of Medicine, Suez Canal University. All participants signed an informed consent form included aim and benefits of the study before starting the study.

All patients were subjected to full medical history taking included sociodemographic characteristics, family history of hair loss (maternal or paternal heredity), medication history, sexual history &menstrual and gynecological history. Patients with hirsutism, menstrual irregularities, history of infertility or suspected to have hormonal irregularities were examined and assessed by the gynecologist to exclude polycystic ovaries syndrome or female hyper-androgenic disorders that can cause FPHL like picture.

Clinical diagnosis of FPHL was done by trained dermatologist and it was based on clinical findings of the distribution of hair loss, decrease in hair density over the crown area and widening of the central part of the scalp, Hair pull test may also found to be positive in frontal area [11].

FPHL severity was graded using the Ludwig scale, which divided the severity of hair density reduction over the crown area into three clinical grades: **Grade I:**

Perceptible thinning of the hair on the crown, limited in the front by a line 1 - 3 cm behind the frontal hair line. **Grade II**: Pronounced rarefaction of the hair on the crown in the area seen in Grade I. **Grade III**: Full baldness (total denudation) within the area seen in Grades I and II [12].

Patients with depression symptoms were identified by using Hamilton depression rating scale and were excluded from the study [13].

Assessment of female sexual dysfunction was done using validated Arabic version of the Female Sexual Function Index [14]. This index was developed to evaluate the six domains of sexual function of the female (sexual desire, sexual arousal, lubrication, orgasm, satisfaction, and pain). The maximum possible score is 36.0, while the minimal possible score is 2.0, the higher the FSFI score the better the female sexual function (**Appendix 1**). A cutoff score of individual domain of 26.55 is the standard for diagnosis of Female sexual dysfunction [15].

Androgen hormones assay was performed to all patients and controls by measuring total serum testosterone (ng/mL) using Combas Immuno Assays kits and measuring free serum testosterone (pg/ml) and sex hormone binding globulin (nmol/L) using Diametra Immuno Assays (DIA) kits. Participants with abnormal androgen levels were excluded from the study and the study continued on euhormonal females only.

Statistical analysis: Data were analyzed using IBM SPSS software package version 25.0. (Armonk, NY: IBM Corp) Qualitative data were described using frequency and percentage. Quantitative data were described using range (minimum and maximum), mean, standard deviation and median. Significance of the obtained results was judged at the 5% level.

3. Results

This study was carried out on 47 female patients with FPHL and 43 matched normal controls without FPHL to assess female sexual dysfunction in females with FPHL. Mean age of patients group was 30.12 ± 5.49 years versus29.44 ± 5.43 years in control group with insignificant difference between the two groups (Table 1). Family history of patterned hair loss was highly positive in patients group (89.4%) while it was lower in control group (41.9%) with statistically significant relationship between the two groups (Table 1). Most of participants were multipara with percentage of 55.3% in patients group versus 48.8% in control group insignificant difference in Table 1.

Distribution of the studied patients with FPHL according to Ludwig scale grading revealed that 26 patients (55.3%) were grade 1, 20 patients (42.6%) were grade 2 and only one patient (2.1%) was grade 3 Ludwig's classifications (Table 1).

Prevalence of female sexual dysfunction in the studied patients group with FPHL was 44.7% while prevalence in the studied control group without FPHL was 44.2% with insignificant statistical relationship between the two groups (P > 0.05) (Table 2).

Table 1. Frequency distribution of studied and control groups according to age, family history of pattern hair loss, parity and Ludwig's grading of FPHL.

	Patients group (n = 47)		Control group (n = 43)		Test of sig.	P
	No.	%	No.	%		
Age (years)						
Min. - Max.	20.0 - 40.0		20 - 39.0			
Mean ± SD.	30.12 ± 5.49		29.44 ± 5.43		t = 0.623	0.534
Median	30.0		29.0			
Family history of patterned hair loss						
No family history	5	10.6	25	58.1		
Maternal	20	42.6	9	20.9	χ^2 = 22.043*	^{MC}p ≤ 0.001*
Paternal	17	36.2	8	18.7		
Both	5	10.6	1	2.3		
Parity						
Nullipara	3	6.4	2	4.7		
Unipara	18	38.3	20	46.5	1.153	0.621
Multipara	26	55.3	21	48.8		
Ludwig's grade in Patients group (n = 47)	No.				%	
Grade 1	26				55.3	
Grade 2	20				42.6	
Grade 3	1				2.1	

χ^2: Chi square test; MC: Monte Carlo; t: Student t-test; P: p value for comparing*: Statistically significant at p ≤ 0.05 between the two groups.

Table 2. Comparison between patients and control groups according to female sexual function FSD prevalence, FSFI score and sexual function domains.

Sexual dysfunction	Patients group (n = 47)		Control group (n = 43)		χ^2	p
	No.	%	No.	%		
FSD	21	44.7	19	44.2	0.002	0.962
No FSD	26	55.3	24	55.8		
Desire						
Min. - Max.	1.60 - 6.0		3.0 - 6.0			
Mean ± SD.	3.70 ± 0.96		3.71 ± 0.63		0.081	0.936
Median	3.60		3.60			
Arousal						
Min. - Max.	1.20 - 6.0		2.70 - 6.0		0.860	0.392
Mean ± SD.	4.65 ± 1.14		4.47 ± 0.81			

Continued

Median	4.50	4.50		
Lubrication				
Min. - Max.	1.50 - 6.0	3.0 - 5.70		
Mean ± SD.	4.28 ± 1.27	4.47 ± 0.79	0.848	0.399
Median	3.90	4.50		
Orgasm				
Min. - Max.	1.20 - 6.0	3.60 - 6.0		
Mean ± SD.	4.76 ± 1.22	5.0 ± 0.64	1.171	0.246
Median	4.80	5.20		
Satisfaction				
Min. - Max.	2.80 - 6.0	3.20 - 6.0		
Mean ± SD.	5.04 ± 1.01	5.24 ± 0.93	0.970	0.335
Median	5.20	5.60		
Pain				
Min. - Max.	2.40 - 5.60	3.0 - 5.80		
Mean ± SD.	3.96 ± 0.92	4.16 ± 0.80	1.113	0.269
Median	3.60	4.60		
FSFI score				
Min. - Max.	10.70 - 34.80	18.90 - 34.90		
Mean ± SD.	26.40 ± 4.61	27.05 ± 3.12	0.788	0.433
Median	27.60	27.90		

FSD: female sexual dysfunction; χ^2: Chi square test; p: p value for comparing between the two groups; FSFI: female sexual function index.

Mean FSFI score was higher in female patients with FPHL than females without FPHL 26.4 ± 4.61 versus 27.05 ± 3.12 respectively with insignificant statistical difference between patients and control groups regarding mean score and all domains of sexual function (Table 2).

Rate of disturbance of sexual function domains in patients group revealed that order of affection was lubrication 72.3%, desire 68%, pain 63.8%, arousal 23.4%, orgasm 14% and the least was satisfaction 10.6% while in control group the order of affection was desire 72%, lubrication 65.1%, pain 62.7%, arousal 27.9%, satisfaction 18.6 and the least was orgasm 11.6% with insignificant statistical relationship between the two groups regarding all domains (Table 3).

Correlation between age and parity in patients and control groups and sexual dysfunction revealed that, age and parity was positively correlated to sexual dysfunction prevalence (P < 0.001), the older the age and more number of deliveries the more prevalent female sexual dysfunction (Table 4).

Correlation between female sexual dysfunction prevalence and grade of female pattern hair loss by Ludwig's classification revealed that in Ludwig's grade

Table 3. Rate of affection of sexual function domains in patients and control groups.

Sexual function domains	Patients group (n = 47)		Control group (n = 43)	
	No.	%	No.	%
Desire	32	68	31	72
Arousal	11	23.4	12	27.9
Lubrication	34	72.3	28	65.1
Orgasm	7	14	5	11.6
Satisfaction	5	10.6	8	18.6
Pain	30	63.8	27	62.7

Table 4. Relation between female sexual dysfunction and age, parity and Ludwig's grading of FPHL in patients and control groups.

Age	Sexual dysfunction		T	P
	No FSD	FSD		
Patients group	(n = 26)	(n = 21)		
Min. - Max.	20.0 - 36.0	25.0 - 40.0		
Mean ± SD	28.0 ± 4.86	32.67 ± 4.89	3.264*	0.002*
Median	28.50	34.0		
Control group	(n = 24)	(n = 19)		
Min. - Max.	20.0 - 35.0	24.0 - 39.0		
Mean ± SD	26.04 ± 4.13	33.89 ± 4.12	6.195*	<0.001*
Median	25.50	34.0		

Parity	No FSD		FSD		χ^2	^{MC}p
	No.	%	No.	%		
Patients group	(n = 26)		(n = 21)			
Nulipara	3	11.5	0	0.0		
Unipara	15	57.7	2	9.5	17.012*	<0.001*
Multipara	8	30.8	19	90.5		
Control group	(n = 24)		(n = 19)			
Nulipara	2	8.3	0	0.0		
Unipara	17	70.8	1	5.3	24.355*	<0.001*
Multipara	5	20.8	18	94.7		

Ludwig grade in patients group	No FSD (n = 26)		FSD (n = 21)		χ^2	^{MC}p
	No.	%	No.	%		
Grade 1	16	61.5	11	52.4		
Grade 2	10	38.5	9	42.9	1.417	0.651
Grade 3	0	0.0	1	4.8		

FSD: female sexual dysfunction; χ^2: Chi square test; MC: Monte Carlo; p: p value for association; *: Statistically significant at $p \leq 0.05$.

1 FPHL patients, 11 patients (52.4%) had FSD versus 16 patients (61.5%) had no FSD, In Ludwig's grade 2 FPHL cases, 9 patients (42.9%) had FSD versus 10 pa-

tients (38.5%) had no FSD, while the only case with Ludwig's grade 3 FPHL had FSD with insignificant statistical relationship between these variables (Table 4).

Correlation between prevalence of female sexual dysfunction and androgen hormones revealed that there was no significant statistical relationship found between levels of total serum testosterone (ng/mL), free serum testosterone (pg/ml) and sex hormone binding globulin (nmol/L) in studied patients and FSD (P > 0.05) (Table 5).

4. Discussion

Female sexual dysfunction has a major impact on the quality of life of female by

Table 5. Relation between female sexual dysfunction and androgen hormones in patients and control groups.

| | Hormones | Sexual dysfunction | | Test of sig. | P |
		No FSD	FSD		
Free testosterone	patients group	(n = 26)	(n = 21)		
	Min. - Max.	0.51 - 4.11	0.27 - 2.42		
	Mean ± SD	1.84 ± 0.89	1.51 ± 0.53	t = 1.616	0.114
	Median	1.75	1.60		
	Control group	(n = 24)	(n = 19)		
	Min. - Max.	0.20 - 2.62	0.62 - 3.22		
	Mean ± SD	1.48 ± 0.57	1.65 ± 0.77	t = 0.809	0.424
	Median	1.43	1.21		
Total testosterone	patients group	(n = 26)	(n = 21)		
	Min. - Max.	0.07 - 0.51	0.01 - 0.58		
	Mean ± SD	0.23 ± 0.12	0.22 ± 0.17	U = 241.50	0.499
	Median	0.24	0.17		
	Control group	(n = 24)	(n = 19)		
	Min. - Max.	0.03 - 0.49	0.03 - 0.46		
	Mean ± SD	0.19 ± 0.12	0.22 ± 0.13	U = 198.0	0.462
	Median	0.18	0.19		
SHBG	Patients group	(n = 26)	(n = 21)		
	Min. - Max.	22.0 - 130.0	17.0 - 150.0		
	Mean ± SD	66.62 ± 35.64	86.76 ± 38.38	U = 193.50	0.088
	Median	57.0	92.0		
	Control group	(n = 24)	(n = 19)		
	Min. - Max.	15.0 - 120.0	24.0 - 115.0		
	Mean ± SD	70.75 ± 33.98	58.11 ± 27.73	U = 178.0	0.221
	Median	75.0	46.0		

FSD: female sexual dysfunction; t: Student t-test; U: Mann Whitney test; p: p value for association; SHBG Sex Hormone Binding Globulin.

disturbing social, emotional, physical and psychological aspects of the female [16].

Female sexual dysfunction has multifactorial pathogenesis including hormonal causes, medical causes, iatrogenic causes and the most important common cause is psychosocial causes which may be due to marital conflicts, strict religious upbringing, traumatic coital experiences disturbed body self image and low self esteem [17].

Female pattern hair loss is a common annoying and distressing condition affecting adult females and in advanced forms affects greatly self esteem and quality of life of affected females. FPHL is presented by preservation of the frontal hairline with diffuse reduction of hair density and hair thickness especially in frontal, parietal and crown scalp areas. The histo-pathological changes in FPHL is similar to male androgenetic alopecia but with different hair loss distribution [18].

In the present study, we found that distribution of the studied patients according to Ludwig's FPHL classification revealed that 26/47 patients (55.3%) were grade 1 Ludwig's grade, 20/47 patients (42.6%) were grade 2 Ludwig's grade and only one patient (2.1%) was grade 3 Ludwig's grade. This result is in the same line with Banihashemi and Nahidi *et al.*, who assessed the level of serum vitamin D in FPHL patients, 28 patients (66.7%) had grade 1 Ludwig's grade, 12 (28.6%) had grade 2 Ludwig's grade and 2 patients (4.8%) had grade 3 Ludwig's grade [19].

Female sexual dysfunction has a major impact on quality of life and a major deteriorating effect on self-esteem and interpersonal relationships of the affected women. In the present study we found that the prevalence of FSD in patients with FPHL was 21/47 (44.7%) while prevalence was (19/43) 44.2% in control group without FPHL between 20 - 40 years old with insignificant statistical relationship between the 2 groups. Sancak and colleagues in 2016 carried out a similar study on 115 females with androgenetic alopecia and 97 control group with and without metabolic syndrome. Similar prevalence (41.3%) of FSD in FPHL was found in females with androgenetic alopecia without metabolic syndrome but prevalence was higher (85.7%) in females with androgenetic alopecia with metabolic syndrome. they found statistically significant relationship between patients and control groups regarding FSD [10].

Prevalence of FSD in control group (44.2%) can express the prevalence of FSD in normal females aged 20 - 40 and this prevalence is in concordance with Salonia *et al.*, who studied 216 women for FSD, and reported prevalence of 46% [20], also is in concordance with Laumann *et al.*, who carried out a national survey study in USA on females aged 18 - 59 years and they reported FSD prevalence of 43% [21].

Lower results were reported by Sancak *et al.*, who found that prevalence of FSD in control females without androgenetic alopecia without metabolic syndrome was 28.9% [10]. Higher results were reported by Ismail *et al.*, who studied 500 sexually active Egyptian women aged between 18 and 55 and found that

About 339 women had sexual dysfunction the prevalence was (67.8%) [22]. Another study carried out by Hassanin *et al.*, who estimated that the prevalence of FSD in the Upper Egypt versus the Lower Egypt was 76.9% versus 68.9% respectively [23]. These contradicted results can be explained by difference in age, Customs and traditions, inclusion and exclusion criteria and method of assessment of FSD.

In the current study we found that mean FSFI score in females with FPHL was higher than females without FPHL, 26.40 ± 4.61 versus 27.05 ± 3.12 respectively (P < 0.05) with insignificant statistical difference between the patients and control group regarding mean score and all evaluated sexual domains. Sancak *et al.* reported that the mean FSFI score in female patients with androgenetic alopecia without metabolic syndrome was 25.43 ± 6.88; this score was 28.39 ± 4.8 for the control group without metabolic syndrome (P < 0.05). While FSD was observed in 52.2% of AGA patients, the rate was 36.1% for those without AGA (p = 0.019). Specific domains comparison revealed that the desire and arousal disorder frequencies were higher in patients with AGA that controls without AGA [10].

We are in agreement with Sancak *et al.*, as the FSFI score was higher in patients group than control group but the difference was that there was no significance in our study. Sancak *et al.*, didn't exclude females whom their partners had erectile or ejaculatory dysfunctions as it is well known that male partner's erectile dysfunction increased the risk of FSD fourfold [24]. They also didn't exclude depressive female as depression may influence FSD in contrary to our study as we excluded patients with depression by using Hamilton depression questionnaire before the study. A review done by Atlantis and Sullivan *et al.*, found the bidirectional association of depression and sexual dysfunction, and confirmed that depression increased the risk of sexual dysfunction and that sexual dysfunction vice versa increase the odds of depression [25].

In the present study, we found that the most affected domains of sexual function in patients group were lubrication 72.3%, desire 68% and pain 63.8% and in control group the most affected domains were desire 72% lubrication 65.1% then pain 62%. Study done by Arafa *et al.*, found that lubrication, arousal and pain were the most commonly affected domains in 95%, 88.2% and 84.9% respectively of enrolled women with anxiety [26]. El Atrash *et al.*, reported that lubrication, arousal and pain disorders in 55%, 62% and 58% of Egyptian women with lower urinary tract symptoms, respectively [27]. Mostafa *et al.*, found that dysfunctions in pain, lubrication and arousal were the most common reported problems 69.3%, 53.3% and 52% in obese premenopausal women respectively [28]. Our results are near similar to the Egyptian studies by Mostafa *et al.*, and El Atrash *et al.*, in FSD prevalence and affected sexual domains and this similarity might be due the shared cultures, mentality and socioeconomic aspects.

In the present study, we found that FSD is significantly correlated with age in both patients and control group as in patients group the mean age for cases with no FSD was 28.0 ± 4.86 years and for cases with FSD was 32.67 ± 4.89 years (p =

0.002), and in control group the mean age for cases with no FSD 26.04 ± 4.13 years and with cases with FSD mean age was 33.89 ± 4.12 years (p < 0.05). These results in close matching to hayas and Richard study who found that woman's sexual function declines with age [29], and also is close matching with a study done by Safarinejad who used a FSFI questionnaire to survey 2626 Iranian women aged 20 - 60 years and found that the prevalence of FSD increased with age [24]. The same results were reported in Aslan *et al.,* study which involved 1009 women in the outpatient clinic of a university hospital in Istanbul who declared the same finding [30].

The limitations of the study, Arab societies like the Egyptian society, talking about sexual disorders is very sensitive which may prevent sexual disorders from being assessed, limited cases with Ludwig grade 3 matching the criteria. Lastly, we could not control other possible confounders, including circumcision, education level, family income, lower urinary tract symptoms, psychological variables (such as body image), and interpersonal variables (such as relationship with a partner). These unconsidered factors should be taken into account in further studies. Our Recommendations was to apply this study on larger scale of patients, diagnosis of FPHL is better to be confirmed by Dermoscopy or Trichoscopy to pick up early cases of FPHL and to use other questionnaires of sexual dysfunction to accurately diagnose sexual dysfunction cases.

5. Conclusion

Current study found that female sexual dysfunction is not affected by female pattern hair loss in premenopausal females. A significant statistical relationship was found between each of age and parity to female sexual dysfunction prevalence. FSD is increased along with increase in age and parity, while androgen hormones levels were not a determinant factor for FSD. It is suggested to establish a female sexual health specialized clinics in healthcare centers to give female sexual function consultations and information's and adjusted with awareness and culture of females to solve the hidden and unreported female sexual dysfunctions especially in Islamic and Arab countries.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Appendix 1

Female Sexual function questionnaire FSFI (English version) [15]

During the past 4 weeks. Please answer the following questions as honestly and clearly as possible. Your responses will be kept completely confidential.

In answering these questions, the following definitions apply:

Sexual activity in our study means vaginal intercourse.

Sexual intercourse is defined as penile penetration (entry) of the vagina. Female Sexual Function Index (FSFI):

Instructions: These questions ask about your sexual feelings and responses, sexual stimulation includes situations like foreplay with a partner, self-stimulation (Masturbation), or sexual fantasy. Check Only One Box per Question. Sexual desire or interest is a feeling that includes wanting to have a sexual experience, feeling receptive to a partner's sexual initiation, and thinking or fantasizing about having sex.

1) Over the past 4 weeks, how often did You feel sexual desire or interest?

☐5 = Almost always or always

☐4 = Most times (more than half the time)

☐3 = Sometimes (about half the time)

☐2 = A few times(less than half the time)

☐1 = Almost never or never

2) Over the past 4 weeks, how would you rate your level (degree) of sexual desire or interest?

☐5 = Very high

☐4 = High

☐3 = Moderate

☐2 = Low

☐1 = Very low or none at all

Sexual arousal is a feeling that includes both physical and mental aspects of sexual excitement. It may include feelings of warmth or tingling in the genitals, lubrication (wetness), or muscle contractions.

3) Over the past 4 weeks, how often did you feel sexually aroused ("turned on") during sexual activity or intercourse?

☐0 = No sexual activity

☐5 = Almost always or always

☐4 = Most times (more than half the time)

☐3 = Sometimes (about half the time)

☐2 = A few times (less than half the time)

☐1 = Almost never or never

4) Over the past 4 weeks, how would you rate your level of sexual arousal ("turn on") during sexual activity or intercourse?

☐0 = No sexual activity

☐5 = Very high

☐4 = High

☐3 = Moderate

☐2 = Low

☐1 = Very low or none at all

5) Over the past 4 weeks, how confident were you about becoming sexually aroused during sexual activity or intercourse?

☐0 = No sexual activity.

☐5 = Very high confidence.

☐4 = High confidence.

☐3 = Moderate confidence.

☐2 = Low confidence.

☐1 = Very low or no confidence.

6) Over the past 4 weeks, how often have you been satisfied with your arousal (Excitement) during sexual activity or intercourse?

☐0 = No sexual activity.

☐5 = Almost always or always.

☐4 = Most times (more than half the time).

☐3 = Sometimes (about half the time).

☐2 = A few times (less than half the time).

☐1 = Almost never or never.

7) Over the past 4 weeks, how often did you become lubricated ("wet") during sexual activity or intercourse?

☐0 = No sexual activity.

☐5 = Almost always or always.

☐4 = Most times (more than half the time).

☐3 = Sometimes (about half the time).

☐2 = A few times (less than half the time).

☐1 = Almost never or never.

8) Over the past 4 weeks, how difficult was it to become lubricated ("wet") during sexual activity or intercourse?

☐0 = No sexual activity.

☐1 = Extremely difficult or impossible.

☐2 = Very difficult.

☐3 = Difficulté.

☐4 = Slightly difficult.

☐5 = Not difficulté.

9) Over the past 4 weeks, how often did you maintain your lubrication ("wetness") until completion of sexual activity or intercourse?

☐0 = No sexual activity

☐5 = Almost always or always

☐4 = Most times (more than half the time)

☐3 = Sometimes (about half the time)

☐2 = A few times (less than half the time)

☐1 = Almost never or never

10) Over the past 4 weeks, how difficult was it to maintain your lubrication ("wetness") until completion of sexual activity or intercourse?

☐ 0 = No sexual activity.

☐ 1 = Extremely difficult or impossible.

☐ 2 = Very difficult.

☐ 3 = Difficult.

☐ 4 = Slightly difficult.

☐ 5 = Not difficult.

11) Over the past 4 weeks, when you had sexual stimulation or intercourse, how often did you reach orgasm (climax)?

☐ 0 = No sexual activity.

☐ 5 = Almost always or always.

☐ 4 = Most times (more than half the time).

☐ 3 = Sometimes (about half the time).

☐ 2 = A few times (less than half the time).

☐ 1 = Almost never or never.

12) Over the past 4 weeks, when you had sexual stimulation or intercourse, how difficult was it for you to reach orgasm (climax)?

☐ 0 = No sexual activity

☐ 1 = Extremely difficult or impossible

☐ 2 = Very difficult

☐ 3 = Difficult

☐ 4 = Slightly difficult

☐ 5 = Not difficult

13) Over the past 4 weeks, how satisfied were you with your ability to reach orgasm (climax) during sexual activity or intercourse?

☐ 0 = No sexual activity

☐ 5 = Very satisfied

☐ 4 = Moderately satisfied

☐ 3 = About equally satisfied and dissatisfied

☐ 2 = Moderately dissatisfied

☐ 1 = Very dissatisfied

14) Over the past 4 weeks, how satisfied have you been with the amount of emotional closeness during sexual activity between you and your partner?

☐ 0 = No sexual activity

☐ 5 = Very satisfied

☐ 4 = Moderately satisfied

☐ 3 = About equally satisfied and dissatisfied

☐ 2 = Moderately dissatisfied

☐ 1 = Very dissatisfied

15) Over the past 4 weeks, how satisfied have you been with your sexual relationship with your partner?

☐ 5 = Very satisfied

☐ 4 = Moderately satisfied

☐3 = About equally satisfied and dissatisfied

☐2 = Moderately dissatisfied

☐1 = Very dissatisfied

16) Over the past 4 weeks, how satisfied have you been with your overall sexual life?

☐5 = Very satisfied

☐4 = Moderately satisfied

☐3 = About equally satisfied and dissatisfied

☐2 = Moderately dissatisfied

☐1 = Very dissatisfied

17) Over the past 4 weeks, how often did you experience discomfort or pain during vaginal penetration?

☐0 = Did not attempt intercourse

☐1 = Almost always or always

☐2 = Most times (more than half the time)

☐3 = Sometimes (about half the time)

☐4 = A few times (less than half the time)

☐5 = Almost never or never

8) Over the past 4 weeks, how often did you experience discomfort or pain following vaginal penetration?

☐0 = Did not attempt intercourse

☐1 = Almost always or always

☐2 = Most times (more than half the time)

☐3 = Sometimes (about half the time)

☐4 = A few times (less than half the time)

☐5 = Almost never or never

19) Over the past 4 weeks, how would you rate your level (degree) of discomfort or pain during or following vaginal penetration?

☐0 = Did not attempt intercourse

☐1 = Very high

☐2 = High

☐3 = Moderate ☐4 = Low

☐5 = Very low or none at all

Thank you for completing this questionnaire.

<u>**FSFI Domain Scores and Full Scale Score:**</u>

The individual domain scores and full-scale (overall) score of the FSFI can be derived from the computational formula outlined in the table below. For the individual domain scores, add the scores of the individual items that comprise the domain and multiply the sum by the domain factor (see below). Add the six domain scores to obtain the full scale score.

It should be noted that within the individual domains, a domain score of zero indicates that the subject reported having no sexual activity during the past month. Subject scores can be entered in the right-hand column.

Domain	Questions	Score range	Factor	Minimum score	Maximum score	score
Desire	1, 2	1 - 5	0.6	1.2	6	
Arousal	3, 4, 5, 6	0 - 5	0.3	0	6	
Lubrication	7, 8, 9, 10	0 - 5	0.3	0	6	
Orgasm	11, 12, 13	0 - 5	0.4	0	6	
Satisfaction	14, 15, 16	0 (or 1) - 5	0.4	0	6	
Pain	17, 18, 19	0 - 5	0.4	0	6	
	Full scale score range			1.2	36	total

A score ≤ 26.55 is classified as FSD.